BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION

In the Matter of	)	
	)	ET Docket No. 18-295
Unlicensed Use of the 6 GHz Band	)	
	)	GN Docket No. 17-183
Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz	)	
	)	

COMMENTS OF IDAHO POWER COMPANY

Idaho Power Company ("Idaho Power") submits these Comments regarding the Federal Communications Commission's ("FCC" or "Commission") Notice of Proposed Rulemaking issued on October 24, 2018, in the above-captioned proceeding. The FCC proposes rules that will promote new opportunities for unlicensed use in portions of the 1200 megahertz of spectrum (6 GHz) while ensuring operations in that band continue to thrive and seeks comment on those proposed rules.

Based on its own experience, Idaho Power is concerned that the proposed rules will impair its ability to reliably operate its electric system and necessitate significant investment, ultimately paid for by Idaho Power's 550,000 customers, to ensure that Idaho Power can operate its system without interference. Idaho Power is particularly concerned that if it is forced to install fiber optic cable to maintain critical infrastructure communication or hire additional employees to identify and resolve interference on the 6 GHz band, these costs will be paid by electric customers.

Idaho Power supports the broader comments of the Utilities Technology Council, the Edison Electric Institute, the American Public Power Association, and the National Rural Electric Cooperative Association. In the comments that follow, Idaho Power

describes its concerns in greater detail and enumerates several suggestions for the Commission's consideration if it decides to implement the proposed rules.

I. IDAHO POWER'S NETWORK INFRASTRUCTURE AND TRAFFIC

Idaho Power is a vertically integrated electric utility with a predominantly rural service territory covering 24,000 miles in southern Idaho and eastern Oregon. Idaho Power operates 32 microwave paths at 6 GHz spanning 844 miles in Idaho and Oregon. These microwave paths connect all types of Idaho Power facilities: offices, substations, transmission stations, gas turbine generating plants, and hydroelectric dams. In addition, Idaho Power interconnects with neighboring entities Bonneville Power Administration and PacifiCorp using 6 GHz microwave to exchange traffic required to operate each utility's respective electrical systems.

Idaho Power's communications network is comprised of approximately 400 miles of fiber optic cable, eight miles of 11 GHz microwave, and 844 miles of 6 GHz microwave paths. In particular, the entire 1.167 gigawatt Hells Canyon hydroelectric dam complex on the rugged Idaho-Oregon border is only connected with 6 GHz microwave. Sixteen of Idaho Power's 26 high voltage substations and generating facilities rely upon 6 GHz microwave paths for their primary operations. All 26 rely upon 6 GHz microwave for backup communications.

II. 6 GHZ ALTERNATIVES ARE INADEQUATE, LACK COVERAGE, OR TOO COSTLY

For Idaho Power, few alternatives exist to using the existing 6 GHz band if interference from unlicensed operations impair Idaho Power's critical infrastructure communication. Depending on less reliable service from commercial telecommunication carriers where such service exists or installing costly fiber optic

cable will not enable Idaho Power to provide reliable, low cost electric service to its customers.

A. Commercial Telecommunication Carrier Services.

Many areas in Idaho are underserved by commercial telecommunication carriers or not served at all. In other areas where commercial carrier services are available, some services offered (digital subscriber lines and cable modem services) are connected directly to the internet and therefore are not suitable. As was evidenced by the electric grid attack in Ukraine in December of 2015 and again in December of 2016, having energy delivery systems and energy delivery subsystems accessible from the internet can quickly turn into a disaster scenario for an electric grid operator.

Arguably, the biggest takeaway from the Ukraine incidents is that simply being connected to the internet as a utility is a risk. A utility operator that is forced to acquire commercial services (if they are available) that only operate over the open internet, and in turn operate critical energy delivery systems over those services, creates an untenable amount of risk to the Bulk Electric System of the United States.

The ability to operate without internet access allows utilities to segment their systems from the Internet, and strictly control their Internet ingress and egress points. This allows for the safe, secure, and reliable operation of critical energy delivery systems without the introduction of the ever-increasing threats posed on the internet by nation state threat actors, organized crime groups, and hacktivists wishing to do harm to or disrupt United States critical infrastructure operators.

The balance of services offered which are suitable for electric utility operations are becoming very difficult, and in some cases impossible, to acquire as they are traditional legacy services for which the commercial carriers either charge high ongoing monthly charges or no longer offer.

Commercial carrier services are not suitable for teleprotection traffic use. Teleprotection traffic switches out high voltage transmission lines quickly when a short circuit or other fault has occurred. These systems operate in fractions of a second, many times within 100 milliseconds. The communication services supporting these systems operate on a 10-millisecond timeframe. Teleprotection traffic cannot tolerate even momentary interference or outages. Teleprotection systems require communication services with very low one-way latency, on the order of 10 milliseconds or less, and do not have the ability to resend data in the event of momentary interference or outage. Interruption to this traffic type puts the entire interconnected power system at risk of maloperation and related blackouts, which may be far reaching throughout the western United States.

In Idaho Power's rural service area, distance also impairs use of commercial carrier alternatives to the 6 GHz microwave band. Teleprotection traffic typically goes from substation to neighboring substations, just like the electrical transmission lines they are associated with. Substations are often located between 10 and 100 miles apart; thus, when using the 6 GHz band, the associated teleprotection traffic travels typically less than 100 miles. Because commercial carrier services are frequently routed to distant cities hundreds of miles away only to return the traffic to the same area, one-way delays of 100 milliseconds or more are common. The low one-way delay needs of teleprotection traffic, typically below 10 milliseconds, result in commercial carrier services not being a suitable alternative to the 6 GHz band.

Even in the unlikely event coverage existed and teleprotection services were available at a reasonable cost with minimal delay, the time to repair the services is not acceptable. Commercial telecommunication services are commonly repaired during the weekdays only and often are unavailable for many days until service is repaired and

returned to useful function. Electric utilities like Idaho Power cannot rely upon such services to provide continuous electric service.

B. Fiber Optic Cable.

Another option to transport Idaho Power's traffic is fiber optic cable. Fiber optic cables offer excellent bandwidth and delay performance and are well suited for utility traffic transportation. However, the cost of materials, labor, and rights-of-way to install fiber optic cable is prohibitively expensive. Consequently, Idaho Power relies on 6 GHz microwave for distances greater than 10 miles because it is less expensive than installing fiber optic cable. Because Idaho Power's Idaho and Oregon service areas are mostly rural (i.e., substations are located far apart), 6 GHz microwave is nearly always the lowest cost option. Thus, Idaho Power has low penetration of fiber optic cables in its network.

Idaho Power's average 6 GHz microwave path length is just over 26 miles with six of those paths longer than 40 miles. Given these microwave path lengths, replacing 6 GHz microwave paths with 11 GHz paths is not possible due to 11 GHz microwave shorter range capability. This is particularly true in the rural parts of Idaho and Oregon where few developed communication sites exist. Developing new sites is difficult with Idaho and Oregon's mountainous terrain, lack of roads, little to no commercial power infrastructure, and assumes federal land permits can be obtained. Federal land permits are subject to the National Environmental Protection Act, making them difficult, if not impossible, to acquire.

If Idaho Power suffered interference to just a quarter of its 6 GHz microwave system, rendering it unusable, the cost to replace it with fiber optic cable would range from $20,000 (on distribution facilities) to $70,000 (on transmission facilities) per mile. Also, the fiber optic cable route would almost certainly be longer than the line of sight

microwave path it replaces. A simplistic estimate for replacing microwave paths mile per mile with fiber optic cable for just this quarter of Idaho Power's 6 GHz microwave system, 211 miles, ranges between $4.2 million and $14.8 million. These estimates do not include right-of-way acquisition, which may be quite costly.

Finally, Idaho Power is particularly concerned that if it is forced to secure suitable fiber optic communication or hire additional employees to identify and resolve interference on the 6 GHz band, these costs will be paid by rural electric customers.

III. MITIGATION OF INTERFERENCE

For the above reasons, Idaho Power does not believe opening the 6 GHz band used by utilities for critical infrastructure communication to unlicensed users is in the best interests of electric customers who rely on the reliable, low cost electric service enabled by the 6 GHz microwave band. Nevertheless, if the Commission expands accessibility to the 6 GHz band, Idaho Power requests that it proactively regulate its use to minimize impacts to the noise floor in the 6 GHz region. Such interference, or "noise," will reduce the fade margin of existing microwave paths and decrease availability. Idaho Power is further concerned with intermittent, higher power interference occurring at the same time as a teleprotection system needs to operate. Both concerns present risk to electrical system reliability in Idaho, Oregon, and the entire western electrical interconnection.

To promote harmonious use of the 6 GHz band and minimize interference, the FCC should:

- Require use of a single automatic frequency coordination ("AFC") system. This will result in the most rapid identification of the interfering entity rather than requiring the impacted party to subscribe to and search multiple AFCs.

- Require AFC database updates from the FCC's Universal Licensing System ("ULS") database occur nightly, at a minimum. Even so, Idaho Power is concerned that many microwave receivers are not accurately documented in the ULS, thus limiting the ability of the AFC to accurately model and calculate interference.

- Allow existing FCC Part 101 microwave users full access to the AFC system without charge.

- Require proactive identification and resolution of potential interfering operations a priori rather than after the fact. Prior coordination of unlicensed operations, particularly outdoor operations, will help alleviate both interference and the substantial time it takes to identify interference by avoiding it from the outset. Assuming it is possible for a motivated utility to locate transient or intermittent interference, utilities have no authority to resolve the interference. Contacting the FCC on such matters is time and resource intensive for all involved.

IV. CONCLUSION

As explained above, few alternatives exist to using the 6 GHz band—and none are particularly good ones. Depending on less reliable service from commercial telecommunication carriers (where such service exists) or installing costly fiber optic cable will not enable Idaho Power to provide reliable, low cost electric service to its customers. Because it relies so heavily on uninterrupted access to the 6 GHz band for communications with critical infrastructure that provides an essential service to its customers, Idaho Power does not support allowing broader access to the 6 GHz band if it diminishes microwave quality in any respect. Idaho Power is particularly concerned that if it is forced to install expensive fiber optic cable or hire additional employees to identify and resolve interference on the 6 GHz band, these costs will be paid by electric customers.

If the FCC proceeds with implementing its proposed rules, Idaho Power respectfully requests the Commission adopt the recommendations of those entities currently using the 6 GHz band to minimize potential interference by unlicensed users going forward.

Respectfully submitted this 14th day of February 2019.

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